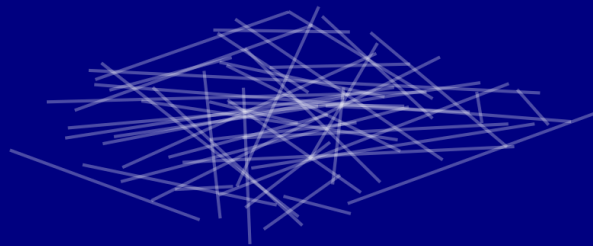
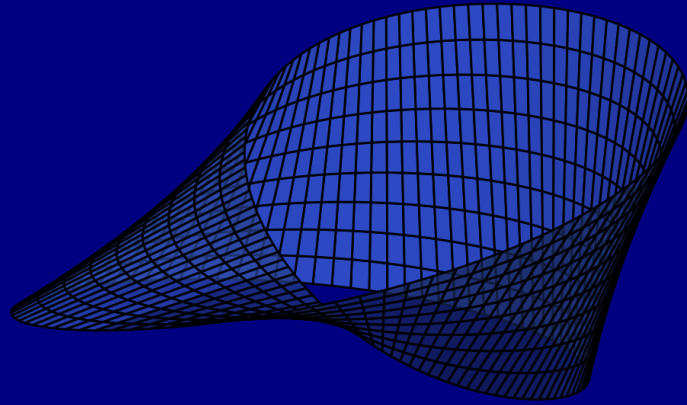


I am a Strange Loop

for saxophone quartet



Juan S. Vassallo
2024

I am a Strange Loop

For Saxophone Quartet, Accordion and Organetto Portativo/Synthesizer

Synopsis

A *strange loop* can be seen as a form of recursion that creates a sense of infinity: it describes elements that appear repeated in self-similar ways. The piece 'I am a Strange Loop' is inspired by this idea but in relation to how *our* self and consciousness can arise out of mere organic matter. According to Douglas Hofstadter, our consciousness and self are a result of complex self-referential loops in the brain. Our sense of self arises from the recursive processes of thought, reflection, and self-awareness. In this piece, I investigated this idea and its metaphorical translation into a musical narrative. From a constructive standpoint, I have formalized several musical parameters from a preexistent composition -the Canon N. 3 from The Musical Offering BWV 1079 by J.S. Bach- and resynthesized them into a new musical work in a way that these parameters emerge across multiple new musical dimensions, such as scales, tuning, rhythm, dynamics, and timbre. In addition, part of the artistic investigation in this piece was focused on generating real-time synthesis and sound processing based on brain data readings using an fNIRS helmet via the use of a newly developed software interface that communicates between the fNIRS helmet and Ableton Live.

fNIRS

Functional near-infrared spectroscopy (fNIRS) is a non-invasive tool to continuously assess the oxygenation of localized areas of the brain. By utilizing the near-infrared spectrum, fNIRS allows light to pass through biological tissues, where it is absorbed by chromophores like oxyhemoglobin and deoxyhemoglobin¹. The key advantage of fNIRS lies in its portability, as it consists only of a helmet connected wirelessly to a signal amplifier, and its capacity for monitoring natural-life situations, such as a musical performance².

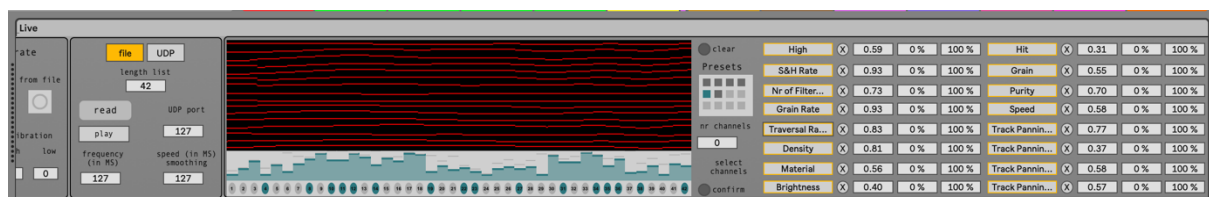
¹ Hasan Ayaz et al., "Chapter 3 - The Use of Functional Near-Infrared Spectroscopy in Neuroergonomics," in *Neuroergonomics*, ed. Hasan Ayaz and Frédéric Dehais (Academic Press, 2019).

² Atsumichi Tachibana et al., "Prefrontal activation related to spontaneous creativity with rock music improvisation: A functional near-infrared spectroscopy study," *Scientific Reports* 9, no. 1 (2019), <https://doi.org/10.1038/s41598-019-52348-6>, <http://dx.doi.org/10.1038/s41598-019-52348-6>, and

fNIRS_to_Live

In order to be performed with electronics coming from brain readings, the piece requires a NIRSport2 fNIRS helmet³ and the Max4Live device *fNIRS_to_Live*. This software can be requested to ***juan.vassallo@uib.no***.

The *fNIRS_to_Live* device, developed by Juan S. Vassallo and Ryan McCardle, directly communicates between an fNIRS helmet and Ableton Live, enabling real-time work with spectroscopic brain readings as a source for live artistic experimentation, both in sound and video. It is capable of receiving a stream of 42 channels as OSC messages via a UDP receiver function. From these 42, it is possible to choose those to be shown on the graphic viewer and map these lines (up to 8 simultaneously) as control signals for diverse Live -and external- audio and MIDI effects via the *mapping* function. In addition, the device includes a *calibration* function that learns the maximum and minimum values of each channel over a desired time and a *hand scaling* tool that allows for choosing manually the upper and lower values to be scaled. In a second version, I adjusted the normalization function, added a filter function, and a speed limit for the data reception, which yields a smoother stream of numbers.



User interface of *fNIRS_to_Live*

³ More information here: <https://nirx.net/nirsport>

I am a strange loop

Performer's notes

Vibrato

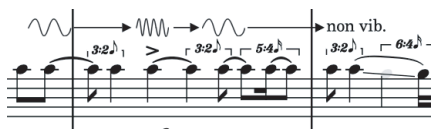
Different types of vibrato are indicated with a wavy line above the notehead:

wide and slow: 

wide and fast: 

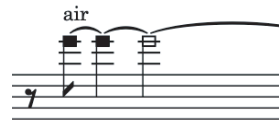
no vibrato: no vib.

The arrows indicate transitions between them. E.G.:

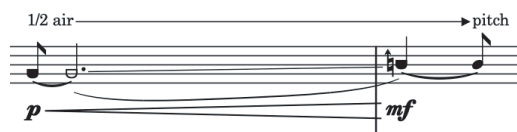


Air sounds

Air sounds means the sound of air through the instrument (no pitch). A square notehead indicates only air sound, and different degrees of 'airiness' are indicated as 'air' (only air sound); '3/4 air' (a little of pitch sound); '1/2 air' (half air/half pitch); '1/4 air' (almost no air sound); 'pitch' (no air, normal sound). Of course these indications with fractions are relative.



Transitions are indicated with an arrow and changes in the shape of the notehead (square to half square/half round notehead, and viceversa).



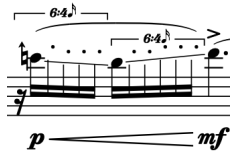
Articulations

Bisbigliando means timbral/microtonal changes over a repeated pitch. It is indicated with 'bisb.' over the notehead, a staccato dot plus a slur:



Embochure bending

Bend from the initial to destination note using the embochure. If not possible, use half-open keys. Articulate the notes slightly staccato.



Microtonality

Microtonal symbols:

$\flat^{\uparrow}$ = slightly higher than flat

$\natural^{\uparrow}$ = slightly higher than natural

$\flat^{\downarrow}$ = slightly lower than natural

$\sharp^{\uparrow}$ = slightly higher than sharp

$\sharp^{\downarrow}$ = slightly lower than sharp

$\sharp^{\dagger}$ = quarter-tone sharp (in-between natural and sharp)

$\flat^{\dagger}$ = quarter-tone sharp (in-between natural and sharp)

I am a strange loop

Juan Vassallo

The first system of the musical score is for the introduction and the first line of the song. It features four staves: S. Sax., A. Sax., T. Sax., and Bar. Sax. The key signature is one flat (B-flat major/D minor) and the time signature is 4/4. A tempo marking at the top left indicates 'A' with a quarter note equal to approximately 65 beats per minute. The S. Sax. and A. Sax. parts are mostly rests, with the A. Sax. playing a single note in the final measure. The T. Sax. part begins with a melodic line marked 'non vib.' and 'pp', followed by a series of eighth and sixteenth notes. The Bar. Sax. part is mostly rests, with a single note in the final measure. Dynamics include 'pp' (pianissimo) and 'mf' (mezzo-forte). Performance instructions include 'pitch vib. (+ 1/4 q.t.)' and 'air' (breath marks).

6

S. Sax.

1/2 air → pitch

bisb. 3:2♭ 5:4♭ 3:2♭ 6:4♭ 3:2♭ 3:2♭ 3/4 air

p *pp* *mf* *mp* *f* *p*

A. Sax.

() → 1/4 air

1/2 air → 3/4 air

mf *p* *mf*

T. Sax.

non vib. → 1/2 air

3/4 air → pitch

pp *mp* *pp* *fp* *f* (*f*)

Bar. Sax.

3/4 air → pitch

1/2 air

pp *mp* *pp* *fp* *mf*

13

S. Sax. *f* *mf* *f* *mf* *f*

A. Sax. *f* *mp* *fp* *f* *mf* *f* *mf* *p* *mf* *a*

T. Sax. *mp* *pp* *p* *pp* *mf* *f* *fp* *mf*

Bar. Sax. *pp* *p* *pp* *fp* *f*

3/4 air → pitch
3/4 air → 1/2 air → 1/4 air

senza vib.

poco accel. $\text{♩} = 72$

17

S. Sax. *mf* *mf* *f* *mf* *f* *p* *p*

A. Sax. *f* *mf* *p*

T. Sax. *p* *f*

Bar. Sax. *mf* *f* *mf* *f* *mf* *f* *mf* *f*

senza vib.

bisb.

altissimo

21

S. Sax. *mf* *p* *mf*

A. Sax. *mf* *p* *mf* *p* *mf* *p*

T. Sax. *mf* *f* *pp* *mp* *pp*

Bar. Sax. *mp* *sf* *mf* *pp* *mp* *mf*

altissimo 8va

123 4 c3

bisb.

senza vib.

bisb.

[illegible]

34

S. Sax. *f* *mf* *f* *mf*

A. Sax. *mf* *f* *mf* *f* *mf*

T. Sax. *f* *mf* *f* *mf* *pp* 123_4_c3

Bar. Sax. *mf* *mf* *f* *mf* *f* *mf*

37

S. Sax. *mf* *f* *mf* *f* *mf*

A. Sax. *f* *mf* *pp* *p* 8va_c1c2c3c4

T. Sax. *mf* *f*

Bar. Sax. *f* *mf* *f* *mf* non vib.

40

S. Sax. *f* *mf* *f* *mf*

A. Sax. *f* *mf* *f* *mf*

T. Sax. *pp* *f* *mf* 123_567_V2

Bar. Sax. *f*



51 **B** ♩ = ca. 85-90

S. Sax.

A. Sax.

T. Sax.

Bar. Sax.

123_4_c3

ppp *ppp sub.* *pp* *f* *mf*

56

S. Sax. *pp* *f* *sf* *mf* *mf*

A. Sax. *pp* *f*

T. Sax.

Bar. Sax. *f* *f*

59

S. Sax. *ff* *mf* *f* *mf*

A. Sax. *p* *f*

T. Sax. *p* *mf* *f* *mf* *f* *mf*

Bar. Sax. *f* *mf* *p* bisb.

* No. 34 in 'Les sons multiple' (Kientzy)

62

S. Sax. *pp* *f* bisb.

A. Sax. *mf* *pp* * 23 Bb 456 Ta

T. Sax. *p* *mf* *f* *mf* *f*

Bar. Sax. *mf* *mf*

75 $\text{♩} = 75$ ac - ce - le - ran - do $\text{♩} = 120$ ral - - - - - len - - - - - tan - - - - - do

S. Sax. *pp* 16 14

A. Sax. *pp* 16 14

T. Sax. *pp* 16 14

Bar. Sax. *pp* 16 14



77 - - - - - $\text{♩} = 100$ ral - - - - - len - - - - - tan - - - - - do - - - - - $\text{♩} = 80$ ral - - - - -

S. Sax. 14 12 12

A. Sax. 14 12 12

T. Sax. *ppp* 14 12 12

Bar. Sax. *ppp* 14 12 12



79 - - - - - len - - - - - tan - - - - - do - - - - -

S. Sax. 12 10 8 *pppp*

A. Sax. 12 10 8 *pppp*

T. Sax. 12 10 8 *pppp*

Bar. Sax. 12 10 8 *pppp*

81 $\text{♩} = 45$ ral - - - len - - - tan - - - do - - - $\text{♩} = 35$ ac - - - ce - - - le - - - ran - - - do - - -

S. Sax. 8 12 14

A. Sax. 8 12 14

T. Sax. 8 12 14

Bar. Sax. 8 12 14

p

83 $\text{♩} = 105$ ral - - - len - - - tan - - - do - - - $\text{♩} = 70$ Transition to Improvisation

S. Sax. 14 8 4 *mp* *ppp*

A. Sax. 14 8 4 *mp* *ppp*

T. Sax. 14 8 4 *p* *ppp*

Bar. Sax. 14 8 4 *p* *ppp*

8va_123_457_c3

Choose alternatively from these
multiphonics (don't repeat successively).
Each multiphonic corresponds to the
cres./dim. gestures in the next box.

Repeat several times (each musician plays independently)

87

S. Sax. 23_456_Eb 8va_123_G#
13_456_EbBb 123_456_Bb_ta

A. Sax. 123_457_C#_c3 123_457_Bb
123_457
8va_c1c2

T. Sax. 12_456_Eb
X_23_567_V1 123_c1
8va_123_467_C#

Bar. Sax. 8va_123_457_c3 X2_45_ta
8va_123_4567 8va_c1c2

dur: 1:30 min aprox.

Play the chosen multiphonic
cres./dim.

after repeating, arrive
to the fermata and wait
for the other musicians

ppp

1:30 approx.

I am a strange loop

*Repeat several times each box
(each musician plays independently)*

*Change the speed and the duration
of the gestures every repetition*

88

vib.

S. Sax.

A. Sax.

T. Sax.

Bar. Sax.

1:30 aprox.



*Repeat several times each line
(each musician plays independently)*

89

vib.

pitch → *air*

S. Sax.

A. Sax.

T. Sax.

Bar. Sax.

pp *ppp* *pp* *ppp*

1:30 aprox.



Repeat several times each line

air only

90

S. Sax.

A. Sax.

T. Sax.

B. Sax.

pp *ppp* *pp* *ppp*

1:00 aprox.

I am a strange loop

72 **C** ♩ = 65 ac - - - - ce - - - - le - - - - ran - - - - do - - - - ♩ = 130 ri - tar - dan - do - ♩ = 75 ac - ce - le - ran - do - ♩ = 120 ral - - - - - - - - len - - - - - - - - tan -

Soprano Saxophone 12 10 6 16 14 *ppp* *pp* *pp*

Alto Saxophone 12 10 6 16 14 *ppp*

Tenor Saxophone 12 10 6 16 14 *ppp*

Baritone Saxophone 12 10 6 16 14 *ppp* *pp*

Accordion 12 10 6 16 14 *Prolongue the notes from the quartet indicated with arrows. Time is approximate.* *ppp*

Organ 12 10 6 16 14 *pppp* *Prolongue the notes from the quartet indicated with arrows. Time is approximate.* *pppp*

scordatura -9 ct. -60 ct. -70 ct. -70 ct. -13 ct. -49 ct. -26 ct.



77 do - - - - ♩ = 100 ral - - - - len - - - - tan - - - - do - - - - ♩ = 80 ral - - - - - - - - len

S. Sax. 14 12 12

A. Sax. 14 12 12

T. Sax. 14 12 12 *ppp*

Bar. Sax. 14 12 12 *ppp*

Accord. 14 12 12

Org. 14 12 12

79 tan do ♩ = 45 ral len tan do ♩ = 35 ac ce le ran do

S. Sax. 12 10 8 12 14

A. Sax. 12 10 8 12 14

T. Sax. 12 10 8 12 14

Bar. Sax. 12 10 8 12 14

Accord. 12 10 8 12 14

Org. 12 10 8 12 14

pppp p



83 ♩ = 105 ral len tan do ♩ = 70 Transition to Improvisation

S. Sax. 14 8 4

A. Sax. 14 8 4

T. Sax. 14 8 4

Bar. Sax. 14 8 4

Accord. 14 8 4

Org. 14 8 4

mp ppp p ppp pppp

87

Repeat several times (each musician plays independently)

Play the chosen multiphonic cresc./dim.

after repeating, arrive to the fermata and wait for the other musicians

Repeat several times each box (each musician plays independently)

Change the speed and the duration of the gestures every repetition

S. Sax.

A. Sax.

T. Sax.

Bar. Sax.

Accord.

Org.

1:30 aprox.

1:30 aprox.



89

Repeat several times each line (each musician plays independently)

vib.

pitch → air

Repeat several times each line

air only

S. Sax.

A. Sax.

T. Sax.

Bar. Sax.

Accord.

Org.

1:30 aprox.

1:00 aprox.